CLAIMS

Please amend the claims as follows:

1. (currently amended) A method of operating a data processing system, said method comprising:

establishing one or more monitoring parameter sets in an integrated circuit processing unit within the data processing system, wherein the one or more monitoring parameter sets indicate one or more criteria by which a plurality of schedulable software entities will be monitored;

the integrated circuit processing unit concurrently executing instructions within a first schedulable software entity and a second schedulable software entity among the plurality of schedulable software entities;

the integrated circuit processing unit monitoring, in hardware, execution of each of a the first and second plurality of schedulable software entities within the integrated circuit processing unit in accordance with a monitoring parameter set among the one or more monitoring parameter sets; and

the integrated circuit processing unit reporting to management software executing in the data processing system utilization of hardware resources of the data processing system by each of the first and second plurality of schedulable software entities;

the management software generating a respective classification of each of the first and second schedulable software entities;

the management software communicating the classifications to the integrated circuit processing unit and storing the classifications in classification storage in the integrated circuit processing unit in association with identifiers of the respective schedulable software entities; and

in response to receipt of at least a classification of the first schedulable software entity by the integrated circuit processing unit, the integrated circuit processing unit dynamically modifying an allocation of hardware resources of the data processing system to the first schedulable software entity, wherein the modifying includes increasing an allocation to said second schedulable software entity of a hardware resource shared by said first and said second schedulable software entities.

2. (previously presented) The method of Claim 1, wherein said establishing a monitoring parameter set comprises the integrated circuit processing unit receiving said monitoring parameter set from said

management software and storing said monitoring parameter set in said integrated circuit processing unit.

3. (previously presented) The method of Claim 1, wherein said reporting comprises said integrated circuit processing unit interrupting said management software.

4. (previously presented) The method of Claim 1, wherein establishing a monitoring parameter set comprises receiving, from software, information identifying an instruction type to be detected when processed by the integrated circuit processing unit and a number of instructions to be detected of the instruction type.

5. (previously presented) The method of Claim 1, wherein:

the management software comprises an operating system;

the method further comprises the operating system scheduling one or more schedulable software entities for execution within the integrated circuit processing unit in accordance with the utilization of hardware resources by each of the plurality of schedulable software entities reported by the integrated circuit processing unit.

6. (canceled)

7. (currently amended) The method of Claim [[6]] 1, wherein:

the management software comprises an operating system; and

the method further comprises the operating system scheduling the one more schedulable software entities by reference to the stored classifications.

8. (canceled)
9. (canceled)

10. (currently amended) A data processing system, comprising:

data storage;

one or more integrated circuit processing units coupled to said data storage, wherein an integrated circuit processing unit among said one or more integrated circuit processing units includes:

one or more execution units that execute instructions;

instruction fetch and dispatch circuitry that supplies instructions to said one or more execution units for execution;

classification storage;

storage for one or more monitoring parameter sets that indicate one or more criteria by which software entities will be monitored; and

a hardware monitor that, responsive to the one or more monitoring parameter sets, monitors, in hardware, execution of each of a plurality of schedulable software entities within the integrated circuit processing unit in accordance with a monitoring parameter set among the one or more monitoring parameter sets and reports to management software executing in the data processing system utilization of hardware resources of the data processing system by each of the plurality of schedulable software entities; and

management software within the data storage that receives reports of utilization of hardware resources from the hardware monitor, that generates a respective classification of each of the plurality of schedulable software entities, and that stores the classifications in the classification storage in association with identifiers of the respective schedulable software entities;

wherein the integrated circuit processing unit includes a resource manager that, responsive to receipt of the classification by the integrated circuit processing unit, dynamically modifies an allocation of hardware resources of the data processing system by increasing an allocation to a second schedulable software entity of a hardware resource shared by an executing first schedulable software entity and said second schedulable software entities.

11. (previously presented) The data processing system of Claim 10, wherein the hardware monitor stores at least one monitoring parameter set within the storage for the one or more monitoring parameter sets in response to receipt of said monitoring parameter set from said management software.

12. (previously presented) The data processing system of Claim 10, wherein said hardware monitor reports said utilization of hardware resources by interrupting said management software.

13. (previously presented) The data processing system of Claim 10, wherein at least one of said one or more monitoring parameter sets comprises information identifying an instruction type to be detected when processed by the integrated circuit processing unit and a number of instructions to be detected of the instruction type.

14. (previously presented) The data processing system of Claim 10, wherein:

the management software includes an operating system;

said data processing system further includes the operating system software within the data storage; and

the operating system schedules one or more schedulable software entities for execution within the integrated circuit processing unit in accordance with the utilization of hardware resources by each of the plurality of schedulable software entities reported by the integrated circuit processing unit.

15. (canceled)

16. (currently amended) The data processing system of Claim [[15]] 10, wherein:

the management software comprises an operating system; and

the operating system schedules the one more schedulable software entities by reference to the stored classifications.

17. (canceled)

18. (canceled)

19. (currently amended) An integrated circuit processing unit for a data processing system, said integrated circuit processing unit comprising:

one or more execution units that execute instructions;

instruction fetch and dispatch circuitry that supplies instructions to said one or more execution units for execution;

classification storage for storing classifications of a plurality of schedulable software entities;

storage for one or more monitoring parameter sets that indicate one or more criteria by which software entities will be monitored; and

a hardware monitor that, responsive to the one or more monitoring parameter sets, monitors, in hardware, execution of each of [[a]] the plurality of schedulable software entities within the integrated circuit processing unit in accordance with a monitoring parameter set among the one or more monitoring parameter sets and reports to management software executing in the data processing system utilization of hardware resources of the data processing system by each of the plurality of schedulable software entities; and

a resource manager that, responsive to a classification by the management software, dynamically modifies an allocation of hardware resources of the data processing system by increasing an allocation to a second schedulable software entity of a hardware resource shared by an executing first schedulable software entity and said second schedulable software entities.

20. (previously presented) The integrated circuit processing unit of Claim 19, wherein hardware monitor stores at least one monitoring parameter set within the storage for the one or more monitoring parameter sets in response to receipt of said monitoring parameter set from said management software.

21. (previously presented) The integrated circuit processing unit of Claim 19, wherein said hardware monitor reports said utilization of hardware resources by interrupting said management software.

22. (previously presented) The integrated circuit processing unit of Claim 19, wherein at least one of said one or more monitoring parameter sets comprises information identifying an instruction type to be detected when processed by the integrated circuit processing unit and a number of instructions to be detected of the instruction type.